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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/603,994	06/25/2003	Timothy J. Olson	0543.001	4765
34282	7590	05/24/2005	EXAMINER	
QUARLES & BRADY STREICH LANG, LLP ONE SOUTH CHURCH AVENUE SUITE 1700 TUCSON, AZ 85701-1621			RODRIGUEZ, JOSEPH C	
			ART UNIT	PAPER NUMBER
			3653	

DATE MAILED: 05/24/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b> 10/603,994	<b>Applicant(s)</b> OLSON ET AL.	
	<b>Examiner</b> Joseph C Rodriguez	<b>Art Unit</b> 3653	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
  - If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
  - If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
  - Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 16 February 2005.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-22 is/are pending in the application.
- 4a) Of the above claim(s) 20-22 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-16 is/are rejected.
- 7) ☒ Claim(s) 17-19 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 25 June 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |   |   |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                        | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)    | Paper No(s)/Mail Date. _____  |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____   | 6) <input type="checkbox"/> Other: _____                                    |

EA

***Final Rejection***

Applicant's arguments filed 2/16/05 have been fully considered but they are not persuasive for reasons detailed below.

The prior art rejections are maintained or modified as follows:

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1, 2, 4, 5, 7, 8, 10, 12 and 14-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wright et al. ("Wright") (US 2,648,433) in view of Hayatdavoudi (US 4,670, 161) and Eryurek et al. ("Eryurek")(US 6,601,005).

Wright teaches a method and device (Fig. 2) for detecting roping conditions in a hydrocyclone comprising a hydrocyclone (1) and a pressure sensor (11), wherein said sensor is used to detect possible roping conditions (col. 1, ln. 49-col. 4, ln. 16).

Wright as set forth above thus teaches all that is claimed except for expressly teaching modifying the invention with an ultrasonic sensor enclosed within a housing and mounted on the splash skirt, wherein the sensor produces an output signal indicative of a variation of the cone angle of the underflow discharge. Hayatdavoudi, however, expressly teaches that in addition to sensing pressure at an input conduit as in Wright additional pressure sensors can be placed on the splash skirt to assist in

monitoring the operation of the cyclone (col. 7, ln. 35-47). Further, Eryurek teaches that there are various well known equivalents to the pressure sensor taught by Wright that use ultrasonic sensors to monitor fluid flow within a cyclone and also teaches mounting said sensors directly in the fluid flow tube (col. 1, ln. 15-27; col. 7, ln. 33-col. 8, ln. 22 with fig. 8 teaches sensor 266 mounted in a housing for common sense benefit of protective shielding). Moreover, the sensor taught by Eryurek eliminates the need for the additional sensor and components needed by prior art fluid flow sensor devices (col. 1, ln. 40-47). Further, Applicant is respectfully reminded that claim language consisting of functional language and/or intended use phrasing is given little, if any, patentable weight as the apparatus must merely be capable of functioning, or being used, as claimed. See MPEP 2112.02, 2114. Here, the signal produced by the combination cited above is certainly capable of being indicative of a cone angle variation. Therefore, it would have been obvious at the time the invention was made to a person having ordinary skill in the art to modify the invention of Brown as taught above to simplify the sensing mechanism for the hydrocyclone fluid flow.

Claims 3, 6, 9, 11 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wright in view of Hayatdavoudi and Eryurek as applied to claims 1, 2, 4, 5, 7, 8, 10, 12 and 14-16 above, and further in view of Brown (US 3,358,938).

Wright in view of Hayatdavoudi and Eryurek as set forth above teach all that is claimed except for expressly teaching using said sensor to produce an output signal relative to a baseline threshold which is indicative of a condition of the underflow

discharge. Brown, however, teaches the comparison of the sensor signals relative to an empirical standard size or set point that are indicative of a particle size of the underflow discharge of a hydrocyclone (col. 4, ln. 20-col. 5, ln. 72). Moreover, the use of a baseline threshold or set point allows the operator greater flexibility in controlling the cyclone (Id.). Therefore, it would have been obvious at the time the invention was made to a person having ordinary skill in the art to modify the invention of Wright in view of Hayatdavoudi and Eryurek as taught above for greater control over the cyclone's operation.

### ***Response to Arguments***

Applicant's arguments that the prior art combination fails to teach the claimed features are unpersuasive. In particular, Applicant argues that Wright fails to teach a sensor mounted on the splash skirt of the cyclone, nor the use of a vibration sensor for any purpose. Examiner concedes this point as the prior Office Action stated that Wright merely established that it is known to use a pressure sensor to detect possible roping conditions in a hydrocyclone. However, the other prior art references suggest the concept of placing an ultrasonic sensor at the splash skirt (See Hayatdavoudi, col. 7, ln. 35-47 teaching that "...pressure sensors could be coupled to conduit 22 and additionally to lower outlet 64 [near splash skirt shown in fig. 1] and the signals generated thereby could be utilized as additional controlling parameters in the cyclone separator"; Eryurek, col. 1, ln. 15-27; col. 7, ln. 33-col. 8, ln. 22 teaching that there are various well known equivalents to the pressure sensor taught by Wright that use ultrasonic sensors to

monitor fluid flow within a cyclone and also teaches mounting said sensors directly in the fluid flow tube with fig. 8 teaching sensor 266 mounted in a housing for common sense benefit of protective shielding). Applicant dismisses these prior art teachings, stating that the combined teachings do not in anyway teach the mounting of a vibration sensor to detect the onset of roping. Here, it is again emphasized that Wright already teaches the concept of using sensors to monitor roping and the other prior art references merely supply the type and placement of sensors that can more efficiently monitor the roping. Therefore, as Applicant's arguments fail to address the express teachings of the prior art, the claims stand rejected.

#### ***Allowable Subject Matter***

Claims 17-19 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

#### ***Election/Restrictions***

Newly submitted claims 20-22 are directed to an invention that is independent or distinct from the invention originally claimed. This new claim grouping contains a method that is capable of being restricted on the basis of method apparatus. See MPEP 806.05 (e). That is, a materially different apparatus can be used to practice the process as claimed (e.g., an apparatus with a different sensor configuration).

Since applicant has received an action on the merits for the originally presented invention, this invention has been constructively elected by original presentation for prosecution on the merits. Accordingly, claims 20-22 are withdrawn from consideration as being directed to a non-elected invention. See 37 CFR 1.142(b) and MPEP § 821.03.

Examiner has maintained the prior art rejections, statutory rejections and drawing objections as previously stated and as modified above. Applicant's amendment necessitated any new grounds of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a). The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

### ***Conclusion***

Any references not explicitly discussed above but made of record are considered relevant to the prosecution of the instant application.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to **Joseph C Rodriguez** whose telephone number is **571-272-6942** (M-F, 9 am – 6 pm, EST).

The **Official** fax phone number for the organization where this application or proceeding is assigned is **703-872-9326** (After-Final **703-972-9327**).

The examiner's **UNOFFICIAL Personal fax number** is **571-273-6942**.

Further, information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system.

Status information for published applications may be obtained from either Private PMR or Public PAIR. Status information for unpublished applications is available through Private PMR only.

For more information about the PAIR system, see

**<http://pair-direct.uspto.gov>**

Should you have questions on access to the Private PMR system, contact the Electronic Business Center (EBC) at **866-217-9197** (Toll Free).

Alternatively, inquiries of a general nature or relating to the status of this application or proceeding can also be directed to the **Receptionist** whose telephone number is **571-272-6584**. Further, the supervisor's contact information is Donald Walsh, 571-272-6944.



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Signed by Examiner Joseph Rodriguez

Jcr

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May 20, 2005

A large, stylized handwritten signature in black ink, likely belonging to Joseph Rodriguez, is written over the date.A smaller, stylized handwritten signature in black ink, likely belonging to Donald P. Walsh, is written above the printed name.

DONALD P. WALSH  
SUPERVISORY PATENT EXAMINER  
TECHNOLOGY CENTER 3600